

INTER LINKING OF INDIAN RIVERS: AN OVERVIEW

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ABSTRACT

India is an extremely large country with great geographical variations even within small regions. The rainfall in our country primarily depends on the largely unpredictable and uneven Monsoons. The vulnerability of event of precipitation set apart by delayed droughts and variances in occasional and yearly precipitation is a major issue for the country. This prompts huge variety in the accessibility of consumable water inside the country, for certain bits of the country confronting extreme dry seasons and different parts confronting decimating floods. Lopsided storms have prompted the indication of the waterway basin in the country as water alarm and water excess. The endeavor of interlinking the streams in India targets moving water from flooded areas to areas with water scarcity. The legitimizations given are that the task would prompt gigantic improvement of the country and public reconciliation by eliminating nearby lopsided natural phenomenon, creating business openings and expansion in horticultural and power efficiency. The paper gives a complete report in regards to the matter contemplating the deterministic thought of Interlinking of Indian river. The paper additionally attempts to highlight the different parts of the tremendous venture by bringing knowledge about the subsequent natural calamities that could happen, the expense factor and the specialized issues that appear to have been disregarded in the wake of the publicity encompassing the task. In light of the above perceptions, the paper attempts to propose an aggregate and careful investigation on the execution of the task and its examination with the other more sensible activities to accomplish the ideal objectives.

KEYWORDS: River Interlinking, Water Resources, Flood & Drought

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1. INTRODUCTION

About 70% of water earth contains, the water that is safe for consumption is just 1% of the available water on earth. The increase in the interest for water is driven by quick development in populaces and economies and provides an additional weight on our all around decreasing new water sources. Our nation represents two percent of the world's topographical region and four percent of its new water, which upholds 17% of the total populace and 15 percent of its domesticated animals. In India, as indicated by a review done by W.H.O.: "65% of the all-out populace doesn't have access to clean drinking water and this figure is predicted to rise significantly in the coming many years". Further, dry spell conditions coming about because of climatic changeability cause significant human enduring in various places of the country, in the fundamental type of shortage of water for both fulfillment of homegrown necessities and for crop cultivation. The venture of interlinking of waterways emerges from the craving of our political initiative to give clean consumable water to the residents and to stop the water shortage of the country. "This arrangement pictures transport of 1,500 cubic meters of water each second from the Ganga during the flood season to the Cauvery through a grouping of waterways connecting the Mahanadi, the Godavari, the Krishna and Pennar with these two. A connection between the Brahmaputra and the Ganges is likewise

required to lessen the Brahmaputra floods. This arrangement looks to mitigate the flood issues of the Ganges and furthermore the Brahmaputra while at the same time settling the dry spell in Southern India by redirecting excess waters in these Himalayan Rivers to the peninsular ones. It requires the development of over 1000 km of new connection channels, 10,000 MW of power for transporting water over great nations to empower this water move". This reason is worth commendation since water is perhaps the most essential human necessity and ought to consistently be given priority. Regardless, this endeavor could have veritable natural and monetary consequences as well ecological and financial ramifications too. Along these lines, we recommend that an intensive and full investigation of the different related perspectives should be attempted first before any work is begun.

2. INTERLINKING OF INDIAN RIVERS: A BRIEF HISTORY

Human society have consistently attempted to extend the spatial degree of accessibility of water by the redirection of streams or waterways. Connecting the streams of India has its underlying foundations in the musings of Visvesvaraya, the robust designer of bygone eras. The forerunners to the task for interlinking the Indian streams in the late past were the Ganga Cauvery interface proposition mooted by K.L. Rao (water system pastor of India), in the year 1975 and the Garland Canal thought set forward by Captain Dinshaw Dastur in the Seventies. Mr Rao proposed the "Public Water Grid" whereby the different waterways would be connected, and water moved from the 'excess' stream basins to the 'inadequate' waterway basins. The Garland Canal proposition mooted moving water from the Himalayan Rivers to the peninsular streams through long pipelines. They were anyway both analyzed and discovered unfeasible, the previous on the grounds of the enormous monetary and energy costs included, and the last since it was in fact shaky. In any case, the prospect of interlinking of waterways as of late acquired momentum through the Supreme Court ruling of 31st October 2002 given in regards to Public Interest Litigation that the streams of India ought to be connected within the next 10 years. The G.O.I acting quickly on the order of the zenith court set up a Task Force on the interlinking of streams under the chairmanship of Suresh Prabhu on eighteenth December 2002. The team will supervise linking 30 streams throughout the following 10 years at an expected expense of Rs 5, 60,000 crores.

Due to increasing water demand, the government of India has developed a National Water Policy which maintains basic need and precious national asset. National Water Development Agency (NWDA) suggested the Interlinking of rivers of India. Interlinking of the Rivers is the major project that involves currency, technology, management, resources and mutual understanding of the peoples.

3. INDIA'S WATER RESOURCES

India gets the majority of its precipitation from the northeast storms which are both profoundly erratic and lopsided. The precipitation over the nation is principally orographic, identified with tropical sorrows starting in the Arabian Sea additionally the Bay of Bengal. The late spring rainstorm represents very 85% of the precipitation. The vulnerability of event of precipitation set apart by delayed droughts and changes in occasional and yearly precipitation is a significant issue for the country. The all-out yearly precipitation (counting snowfall) adds up to around 4000 Cu.Km. because of the lopsided dispersion of the rainstorm, a few places of the nation get substantial precipitation and the remaining are starved. A larger than average area of the all-out precipitation on the nation is gotten in the Himalayan catchments of the Ganga-Brahmaputra-Meghna (GBM) bowl. This prompts the flooding of practically every one of the waterways in this basin during the rainstorm. Large parts of Haryana, Maharashtra, Andhra Pradesh, Rajasthan, Gujarat, Madhya Pradesh,

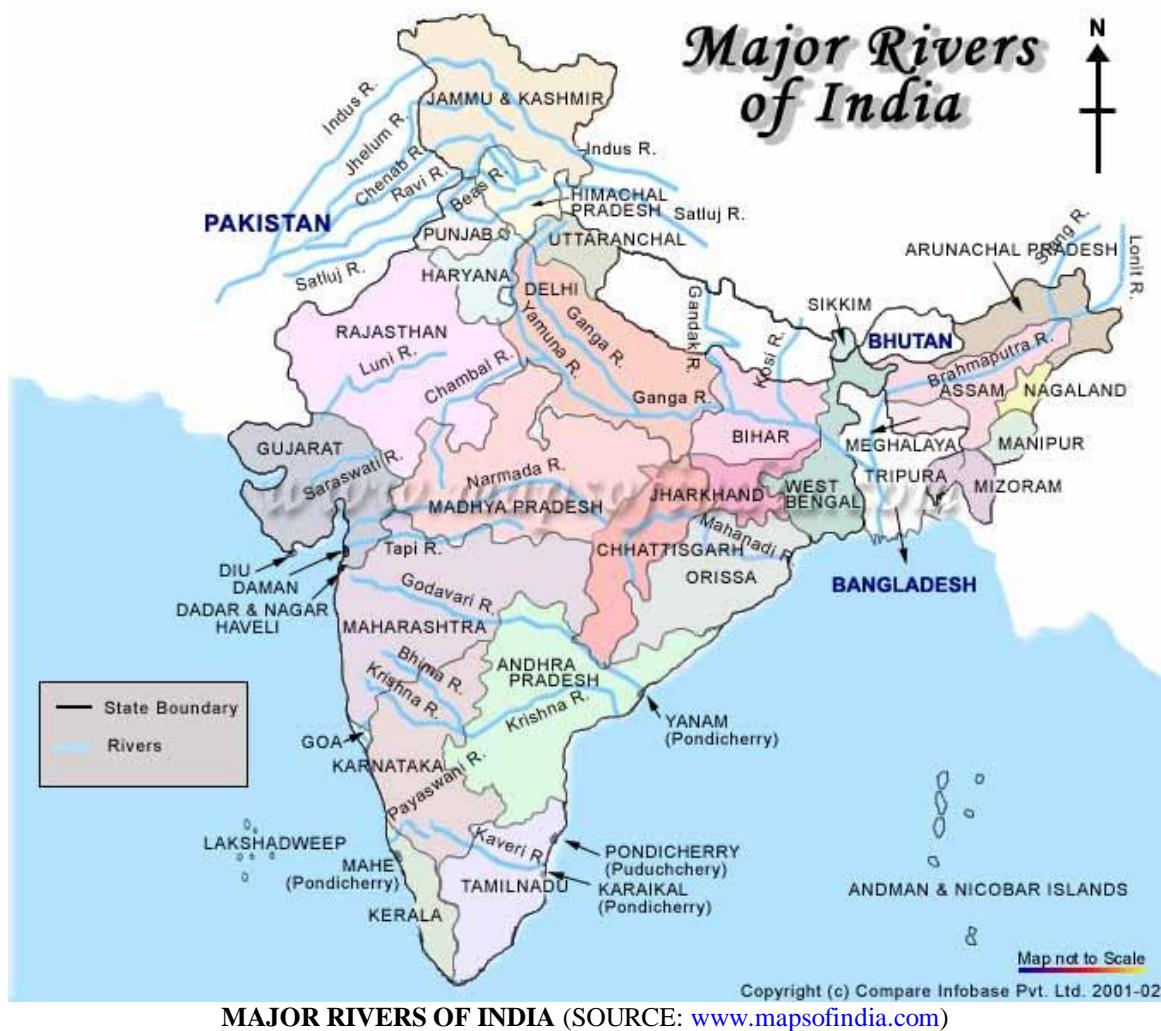
Karnataka and Tamil Nadu are not only in deficit in rainfall but also subject to large variations, resulting in frequent droughts and causing immense hardship to the population and enormous loss to the nation. The accessibility of water in any event, for drinking purposes, turns out to be basic, especially in the late spring a long time as the waterways evaporate and the groundwater retreats. Provincial varieties in the precipitation lead to circumstances when a couple of states needing more water in any event, for raising a solitary yield. Then again, bounty precipitation occurring in certain states of the country causes during floods.

Table 1: Water Resources at a Glance – India

S.No	Items	Quantity (Cu. Km)
1	Annual Precipitation Volume (Including snowfall)	4000
2	Average Annual Potential flow in Rivers	1869
3	Per Capita Water Availability (1997)	1967
4	Estimated Utilizable Water Resources	1122
	(i) Surface Water Resources 690	690
	(ii) Ground Water Resources	432

(Source: Ministry of Water Resources, Government of India)

The northeastern quarter of the nation gets considerably bigger precipitation when compared with the northwestern, western and southern parts. For instance, in the eastern pieces of the GBM bowl, Cherrapunji gets yearly precipitation of around 11,000 mm, while Ajmer gets just around 200 mm of yearly precipitation. The spatial and fleeting varieties inside the precipitation over India frequently bring about human sufferings through shortage of drinking water, flooding of horticultural grounds, disappointment of yields, and so forth. The rationale behind the interlinking task is anticipated on the view that there is 'excess' water in some stream basins or sub-basins, which, whenever moved to the inverse 'shortage' waterway basins, would supply a lasting answer for the issue of human sufferings from dry spells and water shortage.



4. MAJOR LINKAGES

The interlinking proposition basically includes three significant connections:

- Southern Water Grid - Interlinking Mahanadi, Godavari, Pennar, Cauvery and Vaigai inside Peninsular India,
- Interlinking of Brahmaputra with Ganga, Subarnarekha and Mahanadi and
- Interlinking Gandak, Ghaghara, Sarda and Yamuna to Rajasthan and Sabarmati.

Other than these three significant connections, assortments of minor connections have effectively been referenced under the Peninsular and Himalayan Components. A number of colossal dams and channel frameworks are additionally proposed to be developed to store and move floodwater of the abundance streams.

5. BENEFITS CLAIMED BY THE PROJECT

Many reasons have been stated by supporters of the interlinking project. It is claimed that interlinking of rivers would lead to great and quick development of the country by enhancing our G.D.P. growth rate by about 4%, greatly reduce the regional imbalance in the availability of water in different river basins. Other reasons to support the project are:

1. Regional Balancing: The circulation of precipitation in India is exceptionally unpredictable and lopsided throughout existence. There is an enormous variety in the per capita accessibility of water in various waterway basins going from 18,400 cubic meters in the Brahmaputra basin to 380 cubic meters in the Cauvery bowl. Interlinking of streams proposes to scale back the provincial unevenness in the accessibility of water inside the diverse stream basins. Excess rising waters, which are end up flowing to the ocean, would be productively used for giving extra water system, homegrown and modern water establishment, hydropower age, navigational offices and so on.

2. Employment Generation: Implementation of the program would involve the construction of dams/barrages, long canals, tunnels, cross drainage structures, power houses etc. These construction activities will require huge manpower. Increased demand for construction material and machinery/equipment will lead to massive industrialization in the related fields, resulting in enormous increase in employment opportunity, particularly in the rural sector. The project will also increase intensive agricultural activities with higher cropping intensity and keep the agricultural population engaged almost throughout the year. As a result, the usual migration of rural population to urban areas will be reduced with salutary effect on the social harmony of the region.

3. National Development: It is claimed that the river interlinking would provide a great boost to our construction (iron and steel and cement) companies. The storage dams proposed for interlinking of rivers would generate huge hydropower. The total hydropower potential of the entire interlinking of river systems shall be of the order of 34,000 MW installed capacity. Further, we will be able to address our irrigation problems in a very effective manner. This would lead to growing crops all-round the year and making use of the present barren lands. This would definitely lead to boom in our crop production which would ultimately help to increase our foreign reserves. Likewise, since the greater part of the connection channels will be 50 to 100 m wide and in excess of 6 m profound. It is assessed that the venture would at any rate give a 4% increment to our G.D.P.

4. National Integration: Water and air are essential for the survival of man and sharing of available water resources is likewise illustrative of solidarity of our family and our country. By interlinking of streams, the abundance flooding water, which cause ruin during floods and flows to waste into the sea, can be transported to water shortage zones, where it might be gainfully utilized for various purposes. People of both the zones will get benefitted. This will improve the interdependence between the states of the country and will improve National Integration.

6. COST OF THE PROJECT

It is assessed that the undertaking would cost Rs 5,60,000 crores and would require 43 years to complete. This is the expense assessed for interlinking alone. Working of dam's hydroelectric force stations would additionally require tremendous resources. The public authority proposes to raise this tremendous asset through worldwide investment and public-private cooperation. This would squeeze the residents of the country through high charges and make us subject to multinationals for our own water assets. Further, if 5,60,000 crores are to be spent through a brought together pipeline as will be the situation in this venture, the potential for immense payoffs are colossal. Then again, if just Rs.10 lakhs on a normal were given to every one of the under 1 million towns in the country for water collecting, a significant part of the horticultural land in the nation could be inundated. This would mean an all-out expense of under 1,00,000 Crores for the country (under 20% of the expense of this venture). Such an undertaking could be carried out in 2 years if the assets and specialized information were made accessible to every town. On the off chance that the Rs 14,000 Crores that have effectively been spent on the Sardar Sarovar Project had been spent on water gathering in Gujarat, each and every town of

Gujarat would have been dry spell sealed quite a while in the past. Pay for resettlement and restoration of the uprooted: Conventionally, in making the advantage cost investigations of formative undertakings in India, the social expenses are perpetually made light of. Generally crucial of the social expense are the expenses experienced by individuals compulsory uprooting. "In India, fifty million individuals are assessed to have been dislodged in most recent fifty years by the improvement of dams, power plants, roadways and such other foundation advancement projects. Hence not beyond what one-fourth of them could be helped to recover their jobs". For this situation of the interlinking task, till now no authority figure is accessible for the quantity of individuals to be uprooted. Notwithstanding, it is assessed that the organization of channels stretching out to around 10,500 kms would uproot about 5.5 million individuals, who will be for the most part on ancestral land and farmers. Support needs to be provided to the uprooted people. Taking into account the way that the waterway interlinking proposition has been open on the ground that the biggest development project ever inside the world, the previously mentioned figure for the number uprooted appears to be a likely underestimation of the genuine picture. This gets compounded with the way that the public authority is yet to submit itself on a sound and obviously spelt out resettlement and restoration strategy. Additionally, the previous record of the public authority in the Sardar Sarovar Pariyojna isn't excessively encouraging. On the off chance that this basic advance isn't finished and figured out, the trouble of the resettlement and restoration related with the interlinking undertaking is unquestionably come to create a decent number of fights and public interest case, the expense of which will be tremendous.

6. WILL THE INTERLINKING OF RIVERS MULTIPLY THE CONFLICTS RELATED TO WATER?

India is perceived for significant water related struggles, regardless of whether it's among Haryana and Punjab inside the North, or among Karnataka and Tamil Nadu, inside the South. All the more as of late, genuine struggles have arisen among the states sharing the Krishna bowl. Away from the struggles among the states, India has encountered numerous waters related contentions between the authorities and individuals. The absence of a straightforward admittance to data about projects and thusly the restricted idea of the structure for project evaluation and endorsement as utilized at the present in India make such struggles an inescapable a piece of undertaking execution. It is so in light of the fact that the computation of benefits and cost of the tasks are attempted steady for certain old rules. Normally, these rules are old and can't manage this day logical, social or ecological cognizance. On the off chance that the chief principles aren't keeping up with time, it's not astonishing that clashes are getting unavoidable. Accordingly, the courts are progressively assuming control over the organization of water assets in India. On this premise, the interlinking task apparently possesses the potential for producing four particular kinds of contentions. They are: Over remunerations for resettlement and recovery of the dislodged, over remuneration for ecological harms from the task, Over dividing the benefits and expenses of the task between the territories of India.

7. CONCLUSIONS

From the above study we are prepared to induce only one thing that "the interlinking undertaking shouldn't be managed in any condition". The task is neither plausible nor prudent. This idea is unrealistic, expensive and presents ecological and restoration issues. A decision which will affect the existences of millions should go through the meticulousness of complete examination. There are numerous other possible little tasks which will take into account our nation's water needs during a much better route and with none genuine ramifications. The guarantee that the arrangement will create 34,000 megawatts of force, stretch out water system to dry locale inside the country, and lift the GDP by 4% sounds great just on

paper. In the event that the journal of past projects in India is any sign, it's a dream that has been effectively supported through fifty years. In nature what's connected aren't streams however water itself, through the hydrological cycle. We ought to consistently endeavor to change ourselves reliable with nature and will not the slightest bit attempt a contrary path round. A decent water cycle requests a comprehensive strategy that advances timberland cover, forestalls disintegration, improves spring water through miniature watershed structures, and accommodates devastation and upkeep of existing tanks, lakes and repositories. A major, interconnected stream framework would just guide contaminating every one of the waterways and increment highway water clashes. The worth is moreover clearly restrictive. There additionally are numerous restrictions on a piece of researchers/designers to frame any dependable forecasts in ventures of this monster nature. It'll be nothing needing criminal assuming at last, water isn't dealt with as expected, and consequently the water emergency further deteriorates. As of now Shivnath River in Chhattisgarh is privatized, and along these lines the project worker has grabbed away individuals' privilege even to drink. The waterway connecting task will include the improvement of significant dams and trenches which inside the past, very much like the Sardar Sarovar Pariyojna, have lowered huge spaces of woods and other common biological systems, disturbed untamed life passageways and transitory courses, divided regular environments into little, unviable sizes, prompted hydrological and miniature climatic changes, limited the movement of amphibian fauna; presented monoculture cash trimming in order territories prompting vanishing of basic yield and domesticated animals variety and uprooted individuals, coming about not just in gigantic social interruption (a gauge of more than 30 million individuals are dislodged by advancement projects since Independence (source: NBA)), yet additionally to natural obliteration. This monstrous undertaking additionally will execute any fantasy we may have of a coordinated way to deal with water use inside such a seeking after major and minor water system projects, watershed improvement and productivity in water use. Beside of these angles, there are endless other monetary, hydrological, social and ecological issues that need to be tended to. History will not pardon us on the off chance that we don't take a decision after a cautious assessment of the expenses and advantages of connecting waterways. A decision need to up the thing will be the main venture at any point executed in India can't be upheld the impulses and likes of gatherings attempting to track down a handy solution answer for India's water difficulties.

REFERENCES

1. Ministry of Water Resources, Government of India. (1980), *The National Perspective*. New Delhi. <http://wrmin.nic.in/interbasin/perspective.htm>
2. Hina Bhatu & Harji Rank, "Estimating the Water Balance Component in Rangmati River Basin using Swat Model", *International Journal of Agricultural Science and Research (IJASR)*, Vol. 7, Issue 4, pp. 547-554
3. CWC: *Water and Related Statistics* (1998) (New Delhi, Central Water Commission)
4. World Bank (1999) *India: Water Resource Management - The Irrigation Sector*.
5. Mahima Sharma, "Study of High Fluorides in Ground Water Resources 71 of Keshorai Patan and its Health Aspects", *International Journal of Environment, Ecology, Family and Urban Studies (IJEEFUS)*, Vol. 6, Issue 3, pp. 69-74
6. J.Bandyopadhyay and S.Perveen (2002) *Interlinking Indian Rivers: Bane or Boon?*
7. R.R. Iyer (2002) 'Rivers of Discord' *The Times of India*
8. Kinjal Sangani& Kapila Manoj, "Appraisal of Water Quality of TAPI River in Reference to Bacteriological and Physico-Chemical Properties", *International Journal of Applied and Natural Sciences (IJANS)*, Vol. 7, Issue 3, pp. 57-64

9. *Suresh Prabhu (02 March 2003) interview in Indian Express (New Delhi)*
10. *S.Hazarika (May 2003) 'Climb-down on River Linking'*
11. *R. N Athavale (2003) 'Stop This River Link Project' The Statesman (Kolkata)*
12. *Akakuru, O.C., & Akudinobi, B.E.B, "Determination of Water Quality Index and Irrigation Suitability of Groundwater Sources in Parts of Coastal Aquifers of Eastern Niger Delta, Nigeria ", International Journal of Applied and Natural Sciences (IJANS), Vol. 7, Issue 1, pp; 1-6*
13. *Iyer., R. (2003), Water: Perspectives, Issues, and Concerns. New Delhi: Sage Publications*
14. *Shah T., Singhe U. A., McCornick P. G., (2007), India's River-Linking Project: The State of the Debate" Draft. IWMI-CPWF Project on Strategic Analyses of India 's National River-Linking Project, Colombo, Sri Lanka: International Water Management Institute*
15. *Dharmendra Mehta & Naveen K. Mehta (2013), Interlinking of Rivers of India: Issues & Challenges*
16. *Dr. Shazia Waheed and Dr. Pradip Kumar Jha (2017), River Inter-Linking (Ril) Project: A Questio on Indian Federalism.*